SECTION 16715
PREMISES TELEPHONE WIRING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions apply to this Section.

1.2 SUMMARY

A. This Section includes premises wiring for telephone distribution, including installations for service by local private branch exchange and remote switch nodes specified under other sections in this division.

B. Related sections: Include the following:
   1. Section 16450, “Grounding”.
   2. Installation shall meet Category 5e performance requirements.

1.3 DEFINITIONS

A. Local Exchange Carrier: Telephone utility or other entity that provides an access line from a local exchange into the premises.

B. Exchange Access Line: Circuit carrying telephone service into the premises.

C. Distribution Circuit: Circuit from the network interface device to a distribution device, such as a terminal block or junction box.

D. Station Circuit: Circuit from a distribution device to a telecommunications outlet.

E. Telecommunications Outlet: Telephone jack for connecting equipment to communication circuits.

1.4 REFERENCES

A. National Fire Protection Association (NFPA)
   1. NFPA 70, 1999, National Electrical Code

B. Electronics Industries Association (EIA)
   1. EIA/TIA 570, 1991 Residential and light commercial telecommunications wiring standard.
   2. EIA/TIA-568-A-1995, Commercial Building Telecommunications Cabling Standard
   3. EIA/TIA-569-A: Commercial Building Standard for Telecommunications Pathways and Spaces (ANSI).
   4. EIA/TIA-TSB 67: Transmission Performance Specifications for Field Testing of Unshielded Twisted-Pair Cabling Systems.
   5. EIA/TIA-568-A-5, Transmission Performance Specifications for 4 Pair, 100 ohm Category 5e Cabling.
   6. EIA/TIA TSB 95, Technical Services bulletin a5: Additional Transmission Specifications for 4 Pair 100 ohm Category 5 cabling.

C. Insulated Cable Engineers Association (ICEA)
   1. ICEA S-80-576, 1988, Communication Wire and Cable for Wiring of Premises.

D. Underwriters Laboratories, Inc. (UL)
   1. UL 486A, 1997, Wire Connectors and Soldering Lugs for Use with Copper Conductors.
   2. UL 910, Plenum Cables.

1.5 SUBMITTALS

A. Product Data: Include data on features, ratings, and performance for each component specified.

B. Shop Drawings: Include dimensioned plan and elevation views of components. Show access and workspace requirements.
   1. System labeling schedules, including electronic copy of labeling schedules, as specified in Part 3, in software and format selected by Construction Manager.

C. Samples: For combination telephone and workstation outlet connectors, jacks, jack assemblies, and faceplates for color selection and evaluation of technical features.

D. Product Certificates: Signed by manufacturers of cables, connectors, and terminal equipment certifying that products furnished comply with requirements.

E. Qualification Data: For firms and persons specified in "Quality Assurance" Article. Provide evidence of applicable registration or certification.

F. Field Test Reports: Indicate and interpret test results for compliance with performance requirements.

G. Maintenance Data: For products to include in maintenance manuals specified in General Conditions.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: An experienced installer who is a registered communication distribution designer certified by the Building Industry Consulting Service International.

B. Comply with NFPA 70.

C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

D. Meet EIA-TIA-568-A Testing Standards.

1.7 PROJECT CONDITIONS

A. Notify Construction Manager not less than two days in advance of proposed utility interruptions.

B. Do not proceed with utility interruptions without Construction Manager's written permission.

1.8 COORDINATION

A. Coordinate Work of this Section with Owner's telephone switch, telephone instrument, workstation, and LAN equipment suppliers. Coordinate service entrance arrangement with local exchange carrier.

1. Meet jointly with representatives of above organizations and Owner's representatives to exchange information and agree on details of equipment arrangements and installation interfaces.
2. Record agreements reached in meetings and distribute record to other participants.
3. Adjust arrangements and locations of distribution frames, patch panels, and cross connects in equipment rooms and wiring closets to accommodate and optimize arrangement and space requirements of telephone switch and LAN equipment.

1.9 EXTRA MATERIALS

A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
1. Cable: 1000 feet of each size and type used for Project. Furnish on reels.
2. Patch-Panel Units: One of each type for every 10 installed, but not less than one.
3. Connecting Blocks: One of each type for every 25 installed, but not less than one.
4. Outlet Assemblies: One of each type for every 25 installed, but not less than one.

PART 2 - PRODUCTS

2.1 COMPONENTS

A. Comply with EIA/TIA 568-A, and EIA/TIA 568-A-5

B. Telecommunications and Auxiliary Disconnect Outlets: Four-position modular, latching, plug-type, jack-in, flush-mounting wall plate, unless otherwise indicated.

C. Wall Plates: Designed for telephone service with combination data outlet. Match those indicated for power receptacle outlets in same spaces for materials and finish. For wall mounted telephone units, include provision for support of unit.

D. Distribution and Station Cable: Four-pair, No. 24 AWG, solid-copper, unshielded, twisted-pair construction in PVC sheath.
1. Comply with EIA/TIA-568-A and with EIA/TIA TSB 95.
2. Plenum cable is listed for use in plenums.

E. Trunk Cable: Number of pairs as shown, No. 24 AWG, solid copper, unshielded, twisted pair construction in PVC sheath, in compliance with ICEA S-80-576.

F. Cabinets: Comply with Division 16. Furnish cabinets with backboard.

G. Backboard: 3/4-inch (19-mm) interior fire proof grade plywood. Finished side of plywood shall be sanded, primed and painted white with fire resistant paint that is compatible with wood treatment, before installation of any patch panels, cables, terminations or hardware. Where installed in wire closet, height and width shall cover entire wall up to 96 inches (2,500 mm) above floor, unless otherwise indicated.

H. Provide connectorized line cords, minimum 15' length, one for each telephone outlet.

I. UTP Cable: Comply with EIA/TIA-568-A-5, and with EIA/TIA TSB 95. Four thermoplastic-insulated, individually twisted pairs of conductors; No. 24 AWG, color-coded; enclosed in PVC jacket.

J. UTP Plenum Cable: Listed for use in air-handling spaces. Features are as specified above, except materials are modified as required for listing.

K. UTP Cable Connecting Hardware: Comply with EIA/TIA-568-A-5, and with EIA/TIA TSB 95.. IDC type, using modules designed for punch-down caps or tools.
   1. IDC Terminal Block Modules: Integral with connector bodies, including plugs and jacks where indicated.
   2. IDC Connecting Hardware: Consistent throughout Project.

L. Cross-Connect Panel: Modular array of IDC terminal blocks arranged to terminate building cables and permit interconnection between cables.
   1. Number of Terminals per Field: One for each conductor in assigned cables.
   2. Mounting: Backboard or rack as indicated.

M. Patch Panel: Modular panels housing multiple, numbered jack units with IDC-type connectors at each jack for permanent termination of pair groups of installed cables.
   1. Number of Jacks per Field: One for each four-pair conductor group of indicated cables, plus spares and blank positions adequate to satisfy specified expansion criteria.
   2. Mounting: Backboard.

PART 3 - EXECUTION

3.1 APPLICATION

A. Distribution and station cable in all areas, buildings, spaces, etc. shall use the insulation material listed in this section. Teflon or nylon jacketed cables may be used.

3.2 INSTALLATION

A. Telephone Service: Comply with local telephone exchange carrier's requirements for details of telephone service.

B. Install outlet boxes and telecommunications outlets.

C. Install cable without damaging conductors and jacket.
   1. Do not bend cable to a smaller radius than minimum recommended by manufacturer.

D. Install premises wiring in raceways, unless otherwise indicated.
   1. Install cables in walls unless walls are solid or filled with insulation. In solid walls, install in raceway and terminate raceway with a bushing in ceiling space above outlet.
   2. Install cables without raceway where concealed in accessible ceiling space, unless otherwise indicated.
   3. Use pulling methods that will not damage cable or raceway, including fish tape, cable, rope, and wire-cable grips. Do not exceed manufacturer's recommended pulling tensions.
   4. Pull cables simultaneously where more than one is being installed in the same raceway or at the same location.
   5. Conceal raceway, except in unfinished spaces and as indicated.

E. Install exposed cable parallel or perpendicular to surfaces or exposed structural members and follow surface contours where possible.

F. Secure cable to independent supports at intervals as required to prevent sagging between supports. Keep supported cabling at least 24” above accessible ceiling tiles.

3.3 CONNECTIONS

A. Ground equipment.

1. Install ground terminal at local exchange carrier service location and in telecommunications rooms, backboards, cabinets, etc. and connect according to Section 16450.
2. Tighten electrical connectors and terminals according to manufacturers published torque-tightening values. If manufacturers torque values are not indicated, use those specified in UL 486A and UL 486B.

3.4 IDENTIFICATION

A. Identify components and circuits according to Division 16 Section and as shown.

B. Identify telephone system backboards and cabinets with the legend "Telephone."

C. Identify terminals at terminal strips, telecommunications outlets, and pull-and-junction boxes with approved designations.

3.5 FIELD QUALITY CONTROL

A. Testing: Perform the following field quality-control testing:
   1. Test continuity of each circuit pair loop.
   2. Provide a record of test results for future reference.

END OF SECTION 16715